

## PUBLIC

*(Originally filed 12-19-2014; Refiled with revised confidentiality designations 7-22-2016.)*

STATE OF IOWA  
DEPARTMENT OF COMMERCE  
BEFORE THE IOWA UTILITIES BOARD

IN RE:	
COMPLAINT OF REHABILITATION CENTER OF ALLISON	DOCKET NO. FCU-2012-0019

### OCA REPORT

Pursuant to the orders dated September 22 and November 24, 2014, the Office of Consumer Advocate (OCA), Iowa Department of Justice, submits the following report:

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NOTE: Confidential material has been identified by placing it between curly brackets {}.

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## INTRODUCTION

1. This report provides OCA's responses to the questions asked in the docketing and scheduling orders. These questions address issues related to the causes of the difficulties, the routing of the calls, the use of intermediate carriers, the routing changes, how the changes worked to prevent future problems, the standards imposed on intermediate carriers to ensure that calls complete, and what works to prevent call completion problems from occurring in the first place.
2. OCA has sought information in this docket primarily from Qwest Corporation, d/b/a CenturyLink QC (CenturyLink).<sup>1</sup> OCA appreciates the volume of information provided by CenturyLink.
3. The focus on CenturyLink in this docket does not reflect a lack of concern on OCA's part about the practices of the intermediate carriers. OCA has focused and will focus on the practices of the intermediate carriers in other dockets.<sup>2</sup>

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<sup>1</sup>CenturyLink has provided an affidavit attesting to the correctness of the information provided. See OCA Ex. CL-Aff.

<sup>2</sup>See *In re Complaint of UnityPoint Clinic of Family Medicine at*, No. FCU-2013-0004; *In re Complaint of Hancock County Health Systems*, No. FCU-2013-0005; *In re Complaint of Adolphson*, No. FCU-2013-0006; *In re Complaint of Frahm*, No. FCU-2013-0007; *In re Complaint of Pals*, No. FCU-2013-0009. OCA's initial report was filed in No. FCU-2013-0007 on November 13, 2014.

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4. The presiding officer has indicated a focus in this proceeding on finding solutions, as opposed to considering penalties.

5. OCA filed testimony and initial exhibits in this docket on October 30, 2013. Additional exhibits are filed contemporaneously with this report.

### I

#### INVESTIGATION AND DISCOVERY

##### A. Completing calls from Waverly and Shell Rock to Allison

6. The proliferation of rural call completion problems in recent years has coincided with the proliferation of intermediate providers. *In the Matter of Rural Call Completion*, 28 F.C.C.R. 16154 (Nov. 8, 2013) ¶ 88. It appears that hundreds of carriers are involved in carrying calls in Iowa. See *In re Complaint of Frahm*, No. FCU-2013-0007, Verizon motion to dismiss, filed May 30, 2014, p. 9. As appears below and elsewhere, the companies are engaged in large-scale, multi-tiered, joint ventures for the purpose of transmitting the calls. The economic workings of these ventures, and the challenges the companies face in the marketplace, are in many respects hidden from view.

7. In this case, beginning in 2011, according to administrator Kathy Miller, the Rehabilitation Center of Allison in Allison, Iowa, repeatedly did not receive long distance calls and faxes from the Waverly Health Center in Waverly, Iowa, and the Shell Rock Clinic in Shell Rock, Iowa, as well as from other in-state callers, including the

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facility's corporate office in Hampton and one of its care liaisons.<sup>3</sup> Sometimes, the phone did not ring. Sometimes, it rang but no one was there. Sometimes, the reception on an incoming call was broken, but if the parties to the call hung up and the Allison facility placed an outgoing call, the reception was fine. Area clinics and families complained they could not get through. At times, facility personnel would drive from Allison to Waverly or Shell Rock to pick up faxes that would not go through. The difficulties were frequent. They occurred in spurts, with many missed calls over the course of a few days, followed by several weeks without a known recurrence, then another spurt of difficulties. The facility did not know when it missed calls. It lost confidence in the reliability of the phone system. Miller testimony, filed Oct. 30, 2013.

8. The Waverly Health Center is a municipal hospital with an elected board of directors. It is not affiliated with one of the larger health care systems in the state. The Shell Rock Clinic is owned by the Waverly Health Center. At times material, the presubscribed long distance carrier for the Waverly Health Center and the Shell Rock Clinic was CenturyLink. Tiedt testimony, filed October 30, 2013.<sup>4</sup>

9. In an initial effort to address the difficulties, the Allison facility filed three complaints with the Federal Communications Commission (FCC). According to the FCC, these complaints were filed in June and July 2011. The first alleged inability to receive faxes "for quite some time now" and "a lot of trouble" with inaudible and broken

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<sup>3</sup>Allison, population 1,029, is the county seat of Butler County. Waverly, population 9,974, about 18 miles east of Allison, is the county seat of adjacent Bremer County. Shell Rock, population 1,296, about thirteen miles east of Allison, is in Butler County. Population figures are from the 2010 census.

<sup>4</sup>At times material, the local carrier for the Waverly Health Center was CenturyLink, and the local carrier for the Shell Rock Clinic was Butler Bremer Communications. Electronic medical record faxes initiated at the Shell Rock Clinic were in fact sent from the Waverly Health Center and were routed through local carrier CenturyLink. Occasional paper faxes from the Shell Rock Clinic were routed through local carrier Butler Bremer Communications. Tiedt testimony, filed October 30, 2013.

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incoming calls, but no difficulty with outgoing calls. The second alleged that area clinics and families had complained about inability to get through on the facility's fax or phone lines. The third alleged worsening problems with phone and fax lines. Miller testimony, OCA Ex. KM-1, OCA Ex. KM-2, OCA Ex. KM-3, filed Oct. 30, 2013.

10. By letter dated September 15, 2011, the FCC responded that the FCC lacked jurisdiction over the Allison facility's complaints. The FCC suggested the facility contact the Iowa Utilities Board. On September 24, 2012, the facility did so. Administrator Miller recalls the facility received the FCC's response in September 2012, not September 2011. Miller testimony and Ex. K-1, filed Oct. 30, 2013. The Board subsequently docketed these proceedings for the purpose of investigating the difficulties.

11. Although no one kept a log of the difficulties, multiple witnesses corroborated the testimony of Administrator Miller:

A. Michael Berstler, M.D., reported two occasions on which he tried without success to place calls to the Allison facility, probably from the Waverly Health Center.

B. Lori Sharp, a nurse at the Shell Rock Clinic, reported several occasions on which she used her personal cellphone to call Karen Souhrada at the Allison facility because calls and faxes from the Shell Rock Clinic to the Allison facility would not complete. After ten seconds, the phone might ring, but then it went dead.

C. Melissa Rewerts-Johnson, a nurse at the Shell Rock Clinic, reported repeated difficulties with the faxing of medical records, particularly progress notes, to the Allison facility. On her end, it appeared the faxes had gone

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through. When she arrived at the Allison facility, the records were not there. The problem continued about six months. They started mailing the records.

C. Rewarts-Johnson also reported difficulties completing phone calls to the Allison facility. There was a long period of silence, perhaps 15-30 seconds. The calls would eventually go through if she waited long enough.

D. Amy Hylton, a care liaison employed by the Allison facility's corporate parent, recalled at least five occasions on which faxes would not go through. She drove them from Waverly to Allison.<sup>5</sup>

E. Tony Campbell, a maintenance mechanic at the Waverly Health Center, reported at least five occasions on which he received telephone calls from the Shell Rock Clinic about faxes that would not go through to the Allison facility. Upon receipt of these calls, he placed test calls to the Allison facility. He heard twenty seconds of silence or nothing at all. He reported the difficulties to CenturyLink.

Berstler, Sharp, Souhrada, Rewarts-Johnson, Hylton and Campbell testimony, filed Oct. 30, 2013.

12. The difficulties were also reported to Dumont Telephone Co. (Dumont Telco) in Dumont, Iowa, the terminating local exchange carrier for calls placed to the Allison facility.<sup>6</sup> According to Dumont Telco, testing, including test faxes, eliminated

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<sup>5</sup>Hylton recalled perhaps 35 occasions when she could not reach the Allison facility from her cellphone. The phone would ring once, or the call would be answered, but then the call would terminate. Hylton testimony filed Oct. 30, 2013.

<sup>6</sup>Dumont Telco is an incumbent local exchange carrier providing facilities-based telephone service to the communities and rural areas of Dumont and Allison, Iowa, and wireless telephone services to Aplington, Parkersburg and New Hartford, all in Butler County, Iowa. Kregel testimony, filed Jan. 22, 2014. As indicated at paragraph 29 below, Dumont Telco also provides long distance service. The city of Dumont, population 637, is 10 miles west of Allison.

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the local connection as a cause of the call completion failures. Kregel testimony, filed Jan. 22, 2014.

13. According to Waverly Health Center mechanic Campbell, on the occasions on which he reported the difficulties to CenturyLink, CenturyLink opened a trouble ticket. Within the same working day, sometimes within an hour, CenturyLink asked to do test calls. CenturyLink corrected the problem, usually quickly, and the calls and faxes would work. The explanation CenturyLink gave Campbell was “routing issues.” Campbell testimony, filed October 30, 2013.

14. CenturyLink has two long distance networks: the legacy Qwest network and the legacy CenturyLink network. Long distance calls from the Waverly Health Center and Shell Rock Clinic were routed by CenturyLink using the legacy Qwest network. OCA Ex. CL-1; OCA Ex. CL-2.

15. According to CenturyLink, beginning in 2011 and prior to the September 2012 filing of the Allison facility’s complaint with the Board, CenturyLink had opened a number of previous trouble tickets based on difficulties reported by the Waverly Health Center. Three such trouble tickets involved reported failures on calls attempted to the Allison facility. Two additional trouble tickets involved reported failures on calls attempted to other numbers in the same 319-267 NPA-NXX7 as that of the Allison facility. OCA Ex. CL-13, OCA Ex. CL-13S, OCA Ex. C-37, OCA Ex. CL-38, OCA Ex. CL-39. These previous trouble tickets are summarized in the next three paragraphs.

16. Two trouble tickets were opened on June 8 and 23, 2011. They addressed

{ [REDACTED] }

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<sup>7</sup>“NPA” stands for numbering plan area, commonly called “area code.” “NXX” is the central office exchange code, the three digits of a phone number immediately following the area code.



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[REDACTED]  
[REDACTED]  
[REDACTED]}. The intermediate carrier, { [REDACTED] }, was not providing ringback. Following the second ticket, CenturyLink removed { [REDACTED] } from the routing to the NPA-NXX. OCA Ex. CL-13, OCA Ex. CL-13S, OCA Ex. CL-37, OCA Ex. C-38.

17. Two trouble tickets were opened on July 5 and 6, 2011. They addressed “Post Dial Delay // Dead Air” on calls to the Allison facility.<sup>8</sup> On the second of these tickets, the Waverly Health Center reported “15-20 seconds of post-dial delay or simply no ringback” and also reported call quality issues. The second ticket indicates that legacy CenturyLink was unable to process the call. On each of these tickets, legacy CenturyLink did not provide ringback and was removed from the routing. OCA Ex. CL-13, OCA Ex. CL-13S, OCA Ex. CL-39.<sup>9</sup>

18. A trouble ticket was opened July 24, 2012. This trouble ticket addressed “Post Dial Delay // Dead Air” on an attempted call to the Allison facility. According to the ticket, the Waverly Health Center was reporting 20 seconds of post-dial delay or simply no ringback, as well as call quality issues. Legacy CenturyLink was unable to process the call and was removed from the route. The issue was isolated to intermediate carrier { [REDACTED] }, which was also removed from the route. OCA Ex. CL-13S, OCA Ex. 39.

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<sup>8</sup>The information provided in conjunction with the first of these tickets at one point indicates the destination was a number at the Allison facility and at another indicates the destination was a number in NPA-NXX 319-279. OCA Ex. CL-13S, OCA Ex. 39.

<sup>9</sup>According to CenturyLink, the post dial delay on the first of these tickets was within industry standards, and the call on the second ticket eventually did complete. OCA Ex. C-13S, OCA Ex. CL-39.



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19. On October 1, 2012, following receipt of the Allison facility's complaint to the Board, CenturyLink opened a new trouble ticket to address the reported inability of the Waverly Health Center to reach the Allison facility either with calls or faxes, including "dead air" on the calls.<sup>10</sup> The CenturyLink technician determined the failure occurred after the call was handed to intermediate carrier InterMetro. Ex. CL-13, OCA Ex. CL-13S, OCA Ex. 35, OCA Ex. 39, OCA Ex. 40.<sup>11</sup> According to its website, InterMetro owns and operates a national, private, proprietary voice-over-Internet-Protocol (VoIP) network infrastructure.

20. In response to this trouble ticket, a request was made to CenturyLink management not to route calls to another intermediate carrier. OCA Ex. C-39. As explained in an internal CenturyLink e-mail dated October 1, 2012, "[w]e have had previous tickets over multiple carriers to the 319/267 exchange so a Rate Modifier was submitted moving traffic on net."<sup>12</sup> As detailed below,<sup>13</sup> the trouble reported by the Waverly Health Center, as described in the tickets summarized above, had not been the only trouble reported to CenturyLink on calls to the 319-267 NPA-NXX. Nor had

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<sup>10</sup>According to CenturyLink, "call details will show an ATTEMPT on calls that simply were not answered" and that one of the calls was "offered to Dumont Telephone Co. for 42 seconds before the Waverly Health Center released the call." OCA Ex. C-13S, OCA Ex. C-39.

<sup>11</sup>As explained in the joint filing by CenturyLink and OCA on November 25, 2013, CenturyLink had initially designated the identity of intermediate carrier InterMetro as confidential. Following OCA's partial resistance to the request for confidentiality, which disputed the designation of InterMetro's identity as confidential, and following advice from InterMetro that it would consent to being identified in this docket, CenturyLink withdrew its designation of the identity of InterMetro as confidential. The joint filing was without prejudice to CenturyLink's or InterMetro's future ability to claim in any other docket or dispute that the identity of InterMetro or a similarly situated carrier would be protectable in the absence of such consent. The joint filing was also without prejudice to OCA's future ability to resist the confidential treatment of other information.

<sup>12</sup>The e-mail was included in CenturyLink's response to OCA data request no. 25.

<sup>13</sup>See note 25 and accompanying text below.

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{ [REDACTED] }, legacy CenturyLink and InterMetro been the only carriers removed from the routing to the 319-267 NPA-NXX.

21. In order to move the traffic “on net,” CenturyLink activated a permanent change in the routing tables in its switches so that all intrastate calls to the 319-267 NPA-NXX would route over its own “Feature Group” network, { [REDACTED] } [REDACTED]. The change was made on a temporary basis at the request of a repair technician on October 1, 2012. The change was made permanent by a senior engineer eight to ten days later. OCA Ex. CL-3, OCA Ex. CL-3S, OCA Ex. CL-3S2, OCA Ex. CL-38.

22. Following the change, intermediate carriers remained in the routing tables for intrastate calls to the 319-267 NPA-NXX for redundancy in the case of a need for backup and overflow.<sup>14</sup> According to CenturyLink, however, { [REDACTED] } [REDACTED] [REDACTED]. CL-3, OCA Ex. CL-3S, OCA Ex. CL-3S2, OCA Ex. CL-8, OCA Ex. CL-8S, OCA Ex. CL-9, OCA Ex. CL-9S, OCA Ex. CL-29.<sup>15</sup>

23. For the weeks of October 1 and October 8, 2012, the sequence of intermediate carriers on CenturyLink’s routing of intrastate calls to the 319-267 NPA-NXX was as follows (OCA Ex. CL-8S, OCA Ex. CL-9S):

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<sup>14</sup>CenturyLink states there was an exception that InterMetro would not be an intermediate carrier for intrastate calls to the 319-267 NPA-NXX. { [REDACTED] } [REDACTED]. OCA Ex. CL-3, OCA Ex. CL-3S2, OCA Ex. CL-8, OCA Ex. CL-8S, OCA Ex. CL-9, OCA Ex. CL-9S, OCA Ex. CL-29.

<sup>15</sup>CenturyLink made no determination that InterMetro was at fault and did not notify InterMetro of the change or sanction InterMetro. OCA Ex. CL-3; OCA Ex. CL-22; OCA Ex. CL-23; OCA Ex. CL-32.

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Week of	First Intermediate Carrier	Second Intermediate Carrier	Third Intermediate Carrier	Fourth Intermediate Carrier	Fifth Intermediate Carrier
10/1/2012	InterMetro	{ [REDACTED] }	{ [REDACTED] }	{ [REDACTED] }	{ [REDACTED] }
10/8/2012	{ [REDACTED] }	{ [REDACTED] }	{ [REDACTED] }	{ [REDACTED] }	{ [REDACTED] }

24. According to CenturyLink, a call will initially route to the first intermediate carrier listed in the table. If that carrier cannot carry the call, the call will pass back to CenturyLink, which will send it to the next intermediate carrier listed. OCA Ex. CL-8S, OCA Ex. CL-9S, OCA Ex. CL-6S. The processes are automated. OCA Ex. CL-1; OCA Ex. CL-2.

25. In the weeks and months following October 1, 2012, for intrastate calls to the 319-267 NPA NXX, CenturyLink { [REDACTED] }  
[REDACTED]  
[REDACTED]}. OCA Ex. CL-29.

26. When asked to explain any financial consequences of the routing change, CenturyLink stated { [REDACTED] }  
[REDACTED]  
[REDACTED]}. CenturyLink cited its own need when carrying the traffic to pay a tariffed terminating charge to local exchange carrier Dumont Telco and a tariffed tandem charge to Iowa Network Services (INS).<sup>16</sup> These charges at times material were \$0.047157 and \$0.044989 per minute, respectively, or \$0.092146 per minute in sum. Prior to the routing

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<sup>16</sup>INS provides centralized equal access services to independent telephone companies throughout the state, including Dumont Telco. According to INS, traditional long distance traffic should pass through INS's tandem as it originates from or terminates to companies receiving INS's services. CenturyLink also has network connections with INS. Hilton testimony, filed Jan. 22, 2014.

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change, CenturyLink had paid InterMetro at { [REDACTED] } per minute. OCA Ex. CL-5, OCA Ex. CL-5S, OCA Ex. CL-5S2. As observed by Dumont Telco, it was thus economically advantageous for CenturyLink to use facilities other than its own to complete the calls. Kregel testimony, filed Jan. 22, 2014, p. 9. This advantage has since lessened, however, and will continue to lessen, due to the reduction in intrastate access rates required by the FCC's Transformation Order. *In the Matter of Connect America Fund*, 26 F.C.C.R. 17663 (FCC 2011), *review denied*, *In re FCC 11-161*, 753 F.3d 1015 (10th Cir. 2014).

27. The financial information discussed in the preceding paragraph poses some questions. If a particular carrier can complete the calls without paying the terminating charges, there might be an unwarranted competitive advantage. If a particular carrier is completing calls for a price that is lower than the terminating charges it is paying, its business plan is difficult to understand, because it is losing money on those calls. Another possibility is that the carrier is not completing the calls. While the FCC's Transformation Order is probably mitigating these concerns, it will still aid in understanding the financial drivers of the routing practices if Dumont Telco and INS can provide information and perspective on whether and to what extent InterMetro and other carriers utilizing VoIP infrastructure are or are not paying the tariffed charges.<sup>17</sup>

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<sup>17</sup>A listing of the intermediate carriers under contract with CenturyLink potentially to terminate calls to Allison is provided in OCA Ex. CL-42. CenturyLink, although stating that its contracts require intermediate carriers to pay appropriate termination charges, has no specific understanding as to whether InterMetro or other intermediate carriers carrying traffic for CenturyLink are able to avoid or are actually avoiding any terminating carrier's access charges, because CenturyLink does not have visibility into its vendors' networks, and its vendors consider their own networks and termination routes confidential and proprietary. According to CenturyLink, a carrier may have a direct connection to the applicable end office and hence not need the INS tandem service. OCA Ex. CL-33; OCA CL-21.

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28. Following the routing change on October 1, 2012, the delivery of calls and faxes to the Allison facility improved.<sup>18</sup> According to Miller, the pendency of these proceedings assisted in securing the improvement. Miller testimony, filed Oct. 30, 2013. By e-mail dated November 13, 2014, Miller advised that the facility had experienced no recent problems. She advised she would let OCA know of any new difficulties, as she has done throughout the proceedings. With the exception discussed in the next paragraph, no such advice had been received as of the opening of business on December 17, 2014.

29. On December 3, 2014, Miller advised that the Allison facility was unable to complete faxes *to* Shell Rock and Dumont. On December 5, 2014, originating long distance carrier Dumont Telco<sup>19</sup> advised that, according to a report prepared by INS, 21 calls on December 3, 2014, destined for “Shellrock/Dumont/etc.,” reached INS on the originating end and reached Worldcom (Verizon), evidently the intermediate carrier for Dumont Telco, but were not delivered to INS on the terminating end. Dumont Telco further advised that at 5:00 p.m. on December 3, 2014, it removed WorldCom and

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<sup>18</sup>While the facility did subsequently experience some difficulties, they were more sporadic, and the problems were addressed. Miller testimony, filed October 30, 2013, p. 8. The subsequent difficulties are in large part detailed in OCA’s and CenturyLink’s reports to the presiding officer and in the presiding officer’s orders summarizing information provided during the prehearing conferences. The subsequent difficulties involved outgoing as well as incoming calls and faxes, including calls and faxes from and to parties other than the Waverly Health Center and the Shell Rock Clinic. Some involved originating long distance carriers other than CenturyLink. Investigation of these subsequent difficulties did not yield helpful new learning relative to the completion of calls from Waverly and Shell Rock to Allison. In one instance, in response to a reported failure of faxes to complete *from* the Allison facility *to* the Shell Rock Clinic, then originating long distance carrier CenturyLink determined the routing was the issue and removed the intermediate carrier, Excel, from the routing to the NPA-NXX (319-885). See CenturyLink status report filed July 16, 2013; Retka testimony, filed Dec. 13, 2013. In another instance, in response to the reported failure of faxes to complete from a number in Denver, Iowa, to the Allison facility, originating long distance carrier Mediacom identified the intermediate carrier as Level 3 and stated its practice when issues arise is to re-route to an alternate provider or to remove the intermediate carrier from the route. See OCA Ex. M.

<sup>19</sup>The Allison facility switched its long distance service to Dumont Telco on November 7, 2013.

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substituted Sprint, and the calls then completed properly. These developments further illustrate both the continuing problem and the need for industry-wide solutions.

30. Insofar as the causes of the difficulties reported in the Allison facility's complaint are concerned, none of the parties was able to pinpoint a certain answer. The body of evidence summarized above, however, including the restoration of reliable communications from Waverly and Shell Rock to Allison upon the removal of the intermediate carriers, suggests with a high degree of probability that the source of the difficulty lay with the intermediate carriers.

31. As observed by CenturyLink, there are potentially thousands of interconnecting service providers, utilizing a variety of evolving technologies, and thousands of points of interconnection across the United States. Retka testimony, filed December 13, 2013, pp. 2-3. Iowa intrastate calls might be routed anywhere. The sheer complexity of the network, absent adequate accountability and safeguards, all but ensures that difficulties will occur with unacceptable frequency, particularly in rural areas.

32. Investigations in other Iowa dockets have pinpointed two recurrent explanations for the difficulties, both of which appear to be consistent with learning elsewhere. The first is capacity limitations in an intermediate carrier's physical infrastructure, including limited bandwidth that will not support transmission of packets with sufficient speed for effective voice communication, particularly at peak times. See *In re Complaint of Frahm*, No. FCU-2013-0007, OCA Report, filed Nov. 13, 2014, ¶¶ 18-19.

33. Dumont Telco, based on work at the FCC and the National Exchange Carrier Association, has similarly identified physical capacity limitations as a source of

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difficulty. According to Dumont Telco, issues like “dead air” and “post dial delay” arise when equipment utilized by intermediate carriers becomes congested or when VoIP trunks do not have sufficient bandwidth. A reset or reboot of the equipment will eliminate the congestion and allow the calls to complete – but only until the equipment again becomes congested. Kregel testimony, p. 9, filed Jan. 22, 2014.

34. The other established cause of call completion failures is intermediate carrier outages, including so-called “sunny day” outages, often due to software malfunctions, particularly with Internet-protocol infrastructures. In a related context, the FCC has recently emphasized the need for better accountability and more safeguards. See *In re Complaint of Frahm*, No. FCU-2013-0007, OCA Report, filed Nov. 13, 2014, n. 7. CenturyLink recognizes the importance of network outage standards. OCA Ex. CL-50 (Attachment 50B, response to question 7).

35. In summary, based on the learning here and elsewhere, it appears the proliferation of intermediate carriers, not always financially sound, coupled with inadequate monitoring of their performance, inadequate coordination between and among the carriers, and inadequate record-keeping, lie at the core of the problem. The failed calls were probably due in part to inadequate intermediate carrier physical facilities reaching the rural destination. Other, more deliberate, causes cannot be ruled out, but no direct evidence of such causes was uncovered.

### **B. Completing intrastate long distance calls in Iowa generally**

36. Correcting the problem for the Allison facility is not the only goal. The more comprehensive goal is a reliable network for all Iowans.



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37. The docketing order in these proceedings was the first on a rural call completion complaint in Iowa. OCA asked many questions regarding CenturyLink's routing practices. CenturyLink provided a great deal of information. Portions are summarized here.

38. Upon receipt of a long distance call, CenturyLink uses automated tools to determine the routing, based on the NPA-NXX of the terminating number, on whether the call is intrastate or interstate, on availability, and on technical requirements. If an intermediate carrier is used, the intermediate carrier is responsible to CenturyLink to complete the call or to signal back to CenturyLink that it cannot complete the call. OCA Ex. CL-1; OCA Ex. CL-1S; OCA Ex. CL-1S2; OCA Ex. CL-2; OCA Ex. CL-2S.

39. At times material, CenturyLink had contracts with { } intermediate carriers that carried or may have carried traffic to Allison. OCA Ex. CL-42.

40. CenturyLink refers to the intermediate carriers as "partner carriers" or "inter-connect partners" ("ICPs"). OCA Ex. CL-13 (table), OCA Ex. CL-19S3,<sup>20</sup> OCA Ex. C-39 (table), OCA Ex. CL-41.

41. The CenturyLink routing tables for calls to Allison (NPA-NXX 319-297) are of record for each week from January 2011 through August 2013. As indicated in the tables, the routing sequence at times changes from week to week. OCA Ex. CL-1S.<sup>21</sup> The changes at times reflect pricing. For example, { }, the first intermediate carrier in the intrastate routing to Allison for the week of September 17, 2012, was

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<sup>20</sup>OCA Ex. CL-19S3, filed with this report, is the first page of the second of two attachments to the supplemental data request response identified as OCA Ex. CL-19S, filed Oct. 30, 2013. The second attachment was omitted from OCA Ex. CL-19S as unnecessary and cumulative. However, the first page of the second attachment, a "preface," was not included in the first attachment and is therefore filed now.

<sup>21</sup>{ } in the tables means that the calls are routed on { }  
{ }. OCA Ex. CL-1S2.

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removed from the routing the following week due to rate increases from { [REDACTED] }.

OCA Ex. CL-3S2.

42. The intermediate carriers used by CenturyLink generally use a combination of time division multiplexing (TDM) and packet technology. CenturyLink does not, however, have a detailed, real time, view of all of the intermediate carriers' network infrastructures. The interconnection between the CenturyLink long distance network and the networks of the intermediate carriers is TDM-switched in some cases and packet-switched in others. OCA Ex. CL-10.

43. Each intermediate carrier under contract to carry calls for CenturyLink is free to use additional downstream intermediate carriers. CenturyLink does not know the identity of these additional intermediate carriers. OCA Ex. CL-12; OCA Ex. CL-12S.

44. CenturyLink has been aware for some time of call failure rates and concerned with the potential impact on consumers of voice service. OCA Ex. CL-50, (Attachment 50B, response to question 8).

45. In response to a series of requests for information about complaints, trouble tickets and actions regarding call completion failure, post dial delay, poor transmission quality and misidentification of calling party, CenturyLink prepared a series of spreadsheets listing each Iowa<sup>22</sup> trouble ticket addressing a call completion related concern during 2011, 2012 and 2013 for both its legacy Qwest and legacy CenturyLink

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<sup>22</sup>The response to data request no. 43, OCA Ex. CL-43, states that the spreadsheets include all of the trouble tickets for Iowa addressing *intrastate* call completion related concerns. The spreadsheets also include the trouble tickets for some interstate calls terminating in Iowa.

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long distance networks. OCA Ex. CL-43; see OCA Ex. CL-44, OCA Ex. CL-46, OCA Ex. CL-47, OCA Ex. CL-48, Ex. CL-51.<sup>23</sup>

46. The spreadsheets identify each carrier that, according to the trouble tickets, CenturyLink removed from intrastate routing to a designated Iowa NPA-NXX based on the trouble ticket. By OCA's count, there were 41 carriers thus removed from one or more intrastate routes to an Iowa NPA-NXX during 2011, 2012 and 2013. OCA Ex. CL-43.

47. By OCA's count, according to the spreadsheets, the intermediate carriers most frequently removed by CenturyLink from an intrastate route in Iowa based on a trouble report addressing a call completion related concern, and the number of times they were thus removed, were

- { [REDACTED] }<sup>24</sup>
- { [REDACTED] }
- { [REDACTED] }
- { [REDACTED] }
- { [REDACTED] }
- { [REDACTED] }
- { [REDACTED] }
- { [REDACTED] }
- { [REDACTED] }

---

<sup>23</sup>The requests for information asked CenturyLink to include instances, like this one, in which CenturyLink could not confirm the problem complained of but removed the carrier from the routing in an abundance of caution.

<sup>24</sup>IntelPeer was a financially troubled company acquired by Peerless Network, Inc., on November 29, 2013, and subsequently renamed Airus, Inc. See FCC WC Docket No. 13-322.

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- { [REDACTED] }
- { [REDACTED] }
- { [REDACTED] }
- { [REDACTED] }
- { [REDACTED] }
- { [REDACTED] }
- { [REDACTED] }
- { [REDACTED] }.

48. For many Iowa NPA-NXX's, according to the spreadsheets, there were multiple occasions over the three years on which intermediate carriers were removed from the intrastate routing to the NPA-NXX based on trouble tickets addressing call completion related concerns. By OCA's count, there were 130 Iowa NPA-NXX's that were the subject of such removals on three or more occasions and 18 Iowa NPA-NXX's that were the subject of such removals on ten or more occasions. There were 20 occasions on which 7 different carriers were thus removed from the routing to the Allison NPA-NXX, 319-267.25 There were 25 occasions on which 10 different carriers were thus removed from the routing to the West Bend NPA-XXX, 515-887.

49. CenturyLink does not maintain call completion statistics for intrastate long distance calls in Iowa. OCA Ex. CL-45. It { [REDACTED] }

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<sup>25</sup>Many, but not all, of the trouble tickets relating to calls to the 319-267 NPA-NXX were based on the trouble reported by the Waverly Health Center. [REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED] }.

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[REDACTED]  
[REDACTED]}. OCA Ex. CL-50 (Attachment 50B, responses to questions 9 and 10).

50. [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]}. OCA Ex. CL-50

(Attachments 50B, 50F and 50G).

51. [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]}. OCA Ex. CL-50 (Attachments 50B and 50G, response to question 11). These metrics appear to be similar to the “call answer rate” (CAR) and “network efficiency ratio” (NER) that will soon be the subject of industry-wide data reporting pursuant to FCC rule. An understanding of the data requirements set forth in the FCC rules is thus helpful in understanding the data provided in the spreadsheets.

52. In its November 2013 order, the FCC adopted rules requiring long distance providers that make the initial call path choice for more than 100,000 domestic

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<sup>26</sup>Data on completion of interstate calls are relevant to assessing the ability of the network to complete intrastate calls because intrastate and interstate calls use the same network. See *In the Matter of Rural Call Completion*, 28 F.C.C.R. 16154 (Nov. 8, 2013) ¶ 33. CenturyLink is not aware of, nor does any of its work with the long distance network indicate, any difference in the chance a call will fail to complete based on whether the call is intrastate or interstate. OCA Ex. CL-20A. OCA Ex. CL-20A, filed with this report, is a discovery response from CenturyLink in No. FCU-2013-0006, *In re Complaint of Adolphson*.

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retail lines, including local exchange carriers, interexchange carriers, wireless providers and voice over Internet protocol (VoIP) providers, to collect, retain and report specified data elements, with respect to interstate and intrastate<sup>27</sup> calls, for each rural destination, identified by operating company number (OCN),<sup>28</sup> and for nonrural OCNs in the aggregate. 47 C.F.R. § 64.2101, 64.2103, 64.2105. These data elements include number of calls attempted, number of calls answered, and number of calls not answered (reported separately for call attempts signaled as busy, ring no answer or unassigned number). *Id.* The rules have not yet been implemented and are subject to review by the Office of Management and Budget under the Paperwork Reduction Act. *Id.*, ¶ 66. Before any reports are due, the FCC will release a public notice that explains the filing mechanisms in detail. *Id.*, ¶ 66. Some of the details have remained the subject of inquiry and comment.<sup>29</sup> The rules do not apply to intermediate carriers. *Id.*, ¶ 19.

53. When the rules are implemented, they are intended to increase the FCC's ability to identify and redress problems associated with completing calls to rural areas

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<sup>27</sup>Intrastate calls are included in the reporting requirements because they are carried on the same network as interstate calls and because collecting only a partial picture of rural call completion rates may prevent the FCC from ensuring that interstate calls are properly being completed. *In the Matter of Rural Call Completion*, 28 F.C.C.R. (Nov. 8, 2013) ¶ 33.

<sup>28</sup>"OCN" is "a four-place alphanumeric code that uniquely identifies a local exchange carrier." 47 C.F.R. § 64.2101(g). The reporting requirements under the federal rules are limited to incumbent LEC OCNs. 47 C.F.R. § 64.2101(h); see *In the Matter of Rural Call Completion*, 28 F.C.C.R. 16154 (FCC 2013) ¶ 49. A list of rural and non-rural incumbent LEC OCNs appears on the website of the National Exchange Carrier Association (NECA). See Public Notice, "Wireline Competition Bureau Announces Updated List of Rural and Nonrural OCNs for Rural Call Completion Reporting," DA 14-1465, WC Docket No. 13-19 (Nov. 28, 2014). The proper compilation of the list is the subject of ongoing discussions. See CenturyLink, Level 3 and Verizon *ex parte* notice, WC Docket No. 13-39 (Nov. 25, 2014); CenturyLink *ex parte* notice, WC Docket No. 13-29 (Dec. 9, 2014). The FCC has reminded providers that the federal prohibition against call blocking extends equally to all calls, regardless of whether the destination OCN appears on the NECA list. *Id.* For example, Iowa complaint file C-2014-0072 concerns allegedly failed calls to OCN 130A, competitive LEC Mapleton Communications Utility (not on the NECA list).

<sup>29</sup>See Wireline Competition Bureau Seeks Comment on Whether to Clarify Appendix C of the Rural Call Completion Order, 29 F.C.C.R. 3927 (Apr. 21, 2014).

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and to assist the FCC in comparing performance across providers to uncover the source of rural call completion problems. *Id.*, ¶¶ 19, 40, 69. Specifically, the data will enable the FCC to calculate the CAR and NER, the latter reflecting the exclusion of calls that are signaled as busy, ring no answer, or unassigned number. *Id.*, ¶¶ 65, 69. The FCC required the reporting of data elements necessary to calculate both CAR and NER after considering divided comment on which is likely to be more helpful. See *id.*, ¶¶ 70-71.<sup>30</sup>

54. { [REDACTED] }  
 [REDACTED]  
 [REDACTED]  
 [REDACTED]  
 [REDACTED]  
 [REDACTED] }. OCA Ex. CL-50  
 (Attachments 50B and 50G, response to question 11).

<sup>30</sup>In comments submitted May 27, 2014, in FCC Docket No. WC 13-39, the Alliance for Telecommunications Solutions, while stating its member companies support the FCC’s moving forward with the reporting process as illustrated in the FCC’s order, notes substantial evidence in the record that the FCC’s focus on the reporting of CARs is misplaced and that CARs – however they are ultimately determined – will not reliably identify rural OCNs with call delivery issues. The FCC observes at ¶ 71 of its order that NER, standing alone, does not validate whether the call ultimately reached its destination, because, for example, the NER calculation is dependent on reliable signaling and any incorrect or falsified signal could mask problems such as looping or intentional blocking within the network while maintaining a high NER.

<sup>31</sup>{ [REDACTED] }:

	{ [REDACTED] }	{ [REDACTED] }	{ [REDACTED] }	{ [REDACTED] }
{ [REDACTED] }	{ [REDACTED] }	{ [REDACTED] }	{ [REDACTED] }	{ [REDACTED] }
{ [REDACTED] }	{ [REDACTED] }	{ [REDACTED] }	{ [REDACTED] }	{ [REDACTED] }

<sup>32</sup>CenturyLink is the only non-rural OCN in the state.



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55. { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]}. OCA Ex. CL-50 (Attachments 50B and 50G, response to question 14).

56. As indicated by the FCC, the hope is that analysis of data such as these will assist in identifying rural call completion problems and in achieving solutions. It is not clear at this point why any particular CAR or NER represents an acceptable level of performance on the part of an intermediate carrier or even an appropriate trigger for investigation. Nor is OCA aware of any regulatory or industry standard in that respect.

### C. Managing Downstream Carriers

57. In response to a question asking about the testing of intermediate carriers, CenturyLink acknowledged that, with the increasing need in recent years to introduce intermediate carriers into the network, sufficient testing of the network capabilities of the intermediate carriers is extremely important. OCA Ex. CL-19S3. If testing is properly designed and consistently conducted, calls should not be frequently dropped.

58. CenturyLink stated { [REDACTED]

[REDACTED] }

- { [REDACTED]

[REDACTED] };

- { [REDACTED] };

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<sup>33</sup>CenturyLink understands that the listing of rural OCNs in its spreadsheet is a listing of incumbent LEC OCNs. As of the opening of business on December 17, 2014, CenturyLink had not yet confirmed that understanding to OCA.

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- { [REDACTED] };
- { [REDACTED] }.

OCA Ex. CL-19, OCA Ex. CL-19S, OCA Ex. CL-19S3; OCA Ex. CL-41.

59. { [REDACTED]

[REDACTED]

[REDACTED]}. OCA Ex. CL-19.

60. { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]}. OCA Ex. CL-19S,

OCA Ex. CL-41.

61. When asked what, if any, ongoing tests are conducted, CenturyLink responded { [REDACTED]

[REDACTED]

[REDACTED]}. OCA Ex. CL-18S.

62. Dumont Telco { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]}. Kregel testimony, filed Jan. 22, 2014, p. 13.

63. When asked by OCA for a listing of measurements of intermediate carrier compliance or non-compliance with performance requirements or standards, CenturyLink responded { [REDACTED]

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[REDACTED].

OCA Ex. CL-20.

64. { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]. OCA Ex. CL-50 (Attachment 50B, question 5a).

65. { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED].

OCA Ex. CL-50 (Attachment 50B, response to question 5a), OCA Ex. CL-50S.

66. { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]. OCA Ex. CL-50 (Attachment 50B, response to question 5a).

CenturyLink objected to producing these reports to OCA. As of the close of business on

December 18, 2014, the parties may have resolved the issue.

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<sup>34</sup> { [REDACTED]

[REDACTED].

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67. CenturyLink's process for addressing call completion failures begins with the opening of a trouble ticket. If the issue is related to routing, the route path is reviewed and may be changed. If an intermediate carrier is involved in the problem, the intermediate carrier is removed from the call path to the NPA-NXX. A ticket is opened with the intermediate carrier, and the intermediate carrier is required to do a root cause analysis. Testing is required prior to reinstatement. OCA Ex. CL-24.

68. In this case, CenturyLink evidently concluded that InterMetro was not at fault and did not either notify InterMetro or ask InterMetro to do a root cause analysis. See note 15 above.

69. When asked what sanctions CenturyLink may have imposed on intermediate carriers for failure to meet performance requirements or standards,

CenturyLink { [REDACTED]  
[REDACTED]  
[REDACTED]}.<sup>35</sup> OCA Ex. CL-19H.<sup>36</sup>

70. { [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

---

<sup>35</sup> { [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED] }.

OCA Ex. CL-53, OCA Ex. CL-55, OCA Ex. CL-56, OCA Ex. CL-57.

<sup>36</sup>Exhibit CL-19H, filed October 30, 2013, is a discovery response from CenturyLink in No. FCU-2013-0004, *In re Complaint of UnityPoint Clinic of Family Practice at Huxley*.

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[REDACTED]. OCA

Ex. CL-19H, OCA Ex. CL-53, OCA Ex. CL-55, OCA Ex. CL-56, OCA Ex. CL-57.

71. When asked to explain why it continues to use an intermediate carrier on routes other than the route from which it has been removed, CenturyLink responded:

{ [REDACTED] }

OCA Ex. CL-58.

72. In its early discovery responses, CenturyLink { [REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]. OCA Ex. CL-18, CL-

18S2.

73. More recently, on November 6, 2014, CenturyLink produced a confidential new draft template contract to be used in conjunction with CenturyLink's announced intention to invoke the "safe harbor" provisions in the FCC's data recording,

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retention and reporting rules. Again, CenturyLink advises that { [REDACTED]

[REDACTED] }. OCA Ex. CL-18S3.

74. The new draft template contract contains requirements under which an intermediate carrier must:

- { [REDACTED]  
[REDACTED]  
[REDACTED] };
- { [REDACTED]  
[REDACTED]  
[REDACTED] };
- { [REDACTED] };
- { [REDACTED] };
- { [REDACTED] };
- { [REDACTED]  
[REDACTED] };
- { [REDACTED]  
[REDACTED]  
[REDACTED] };
- { [REDACTED]  
[REDACTED] }.

75. The new draft template contract { [REDACTED]

[REDACTED] }

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- { [REDACTED] };
- { [REDACTED] };
- { [REDACTED] };
- { [REDACTED]  
[REDACTED] };
- { [REDACTED] }.

76. The new draft template contract { [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED] }.

77. OCA generally supports the provisions in the new draft template contract as helpful constructs in the effort to solve the problem. The provisions regarding grade of service and post dial delay merit attention, as discussed below.

78. Regarding the { [REDACTED] }, AT&T historically measured the grade of service for a particular group on the basis of the percentage of calls blocked because no trunk is free in that group. Years ago, AT&T asserted it sought to achieve the so-called P.01 grade of service under which it could accommodate 99 per cent of the calls offered to a final group in the busy hour of the average business day of the busy season. *In re AT&T*, Docket No. 19129, 64 F.C.C.2d 1 (FCC 1977) ¶ 125. The “busy hour” is perhaps the most important concept in traffic engineering – the science of figuring what telephone switching and transmission capacities are needed. *Newton’s Telecom Dictionary* (1999). Board rules require local exchange carriers to complete dialing of



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called numbers on at least 97 percent of calls without encountering an all-trunks busy condition, during average busy-season busy-hour (P.03). 199 IAC 22.5(3).

79. In 2014, not all technologies are concerned with “blockage.” Internet protocols, now commonly used in the transmission of voice services, are based on delay rather than blockage. The need for adequate capacities to complete calls, however, is largely the same as it was years past, and so is the mathematics that guides the engineers in preventing the degradation of service.

80. As indicated above, the new draft template contract { [REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED] }.

81. Because all users should receive the same service quality, { [REDACTED]

[REDACTED] }.

82. When asked to identify and explain the industry standards for post-dial delay, CenturyLink responded:

The CenturyLink PSTN switch network has set-up timers in the network. The timer parameter is set to 25 seconds, meaning that the switch will wait 25 seconds to receive a message from the far end to connect the call. SS7 industry standards allow for a range from 20-30 seconds. During the timer set up, the customer may experience a pause until the calls connect. As an example, a single ring-back one is 6 seconds, so a post dial delay of 20 seconds would be equivalent to approximately 4 ring cycles.

OCA Ex. CL-36.<sup>37</sup>

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<sup>37</sup>When asked for these standards, CenturyLink directed attention to the Telcordia website: [http://telecom-info.telcordia.com/site-cgi/ido/docs2.pl?ID=034200202&page=docs\\_doc\\_center](http://telecom-info.telcordia.com/site-cgi/ido/docs2.pl?ID=034200202&page=docs_doc_center). OCA Ex. CL-61.

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83. The FCC defines excessive call setup delay to include a delay before the called party hears ringing that is in excess of 8 seconds. Letter to Thomas Goode, General Counsel, Alliance for Telecommunications Industry Solutions, 26 F.C.C.R. 16454 (FCC 2011). As noted above, { [REDACTED] }.

84. Eight seconds is arguably too long. Nearly twenty years ago, the FCC required local exchange carriers to complete the set-up<sup>38</sup> of all toll-free calls within five seconds, with a mean set-up time for such calls of 2.5 seconds or less. *In re Toll Free Service Access Codes*, CC Docket No. 95-155, 12 F.C.C.R. 11162 n. 22 (FCC 1997). The database access required for the set-up of toll-free calls is technologically the same as the database access required for long distance calls generally, following the implementation of local number portability.

85. { [REDACTED] }  
[REDACTED]  
[REDACTED]:  
{ [REDACTED] }.

OCA Ex. CL-62.

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<sup>38</sup>“Set-up” means that a call has reached the called party’s local exchange carrier, enabling that carrier to signal the calling party’s local exchange carrier that ringback (or a busy signal) may be provided to the calling party.

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86. { [REDACTED] } the need to reduce failed attempts and instead to complete calls more frequently using the first attempted intermediate provider. Again, the testing is extremely important. See also *In re Complaint of Frahm*, No. FCU-2013-0007, OCA Report filed Nov. 13, 2013, ¶¶ 20-23.

87. In an early response to a question asking whether CenturyLink can offer any assurances that rural call completion problems will not recur in the future, CenturyLink stated that if similar issues arise in the future, CenturyLink, following its standard processes, will address them promptly upon being notified and will take the necessary measures to fix any identified problems with its own network as well as with those intermediate carriers used to augment the CenturyLink network. OCA Ex. CL-22H.<sup>39</sup> This response reflected an entirely reactive approach to the problem. Such an approach will not restore a reliable network.

88. More recently, in its informational filing on July 29, 2014, CenturyLink advised the Board of its intention to adopt the “safe harbor” provisions in the FCC data reporting rules. As indicated in the FCC filing attached to the Board filing, CenturyLink is taking all necessary steps to be able to certify to the FCC that it meets each of the safe harbor requirements. Among other particulars, according to the FCC filing, CenturyLink is identifying *one* immediate provider to carry traffic on each call path and is making necessary changes to its existing processes for monitoring the performance of intermediate providers. The FCC filing indicates that CenturyLink will proactively test call completion on an ongoing basis.

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<sup>39</sup>OCA Ex. CL-22H, filed October 30, 2013, is a discovery response from CenturyLink in No. FCU-2013-0004, *In re Complaint of UnityPoint Clinic of Family Practice at Huxley*.

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89. In the new safe harbor negotiations with intermediate carriers, CenturyLink is requiring intermediate carriers either to complete the call to the terminating end or to route it back to CenturyLink so that CenturyLink can find a call path that will directly terminate the call. OCA Ex CL-37A.<sup>40</sup>

90. On December 9, 2014, CenturyLink provided the FCC with an update of its progress in implementing the safe harbor provisions. The update included an outline of CenturyLink's timeframe for nationwide implementation of the safe harbor procedures.<sup>41</sup> OCA has recently sent a data request to CenturyLink asking for this updated information, including the timeframe for implementation in Iowa.

## II

### CONCRETE STEPS TOWARD A LONG-TERM SOLUTION

91. The following are concrete steps that CenturyLink should take as elements of a long-term solution to the problem. These suggested actions are intended to complement the work of the FCC, including the data collection and reporting to be implemented pursuant to the FCC rules. These suggested actions are also appropriate for consideration in a rule-making proceeding, which could afford long-term solutions industry-wide.<sup>42</sup>

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<sup>40</sup>OCA Ex. CL-37A, filed with this report, is a discovery response from CenturyLink in No. FCU-2013-0006, *In re Complaint of Adolphson*.

<sup>41</sup>CenturyLink *ex parte* notice, WC Docket No. 13-29 (Dec. 9, 2014).

<sup>42</sup>As a part of its investigation, OCA asked INS whether it has suggestions for long-term solutions. INS responded that it has discussed the issue and spent time attempting to ascertain the cause of the problem but has yet to determine a consistent common cause of the problem and does not at this time have suggestions for a long-term solution. OCA Ex. INS-1.

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### **Step 1**

#### **Acknowledge responsibility for the performance of downstream carriers.**

92. In an order issued not long ago, the FCC emphasized in a related context the need for “end-to-end” carrier responsibility and accountability from the time a call is placed to the time it is completed.<sup>43</sup> Such end-to-end responsibility is a prerequisite to solving the rural call completion problem. The first step in a long-term solution to the problem is for originating and upstream intermediate carriers to acknowledge responsibility for the performance of the downstream intermediate carriers they engage to complete the calls.

### **Step 2**

#### **Maintain on file with the Board a list of downstream carriers currently being used to carry Iowa traffic.**

93. A simple filing of this character, with contact information for the downstream carriers, updated as changes occur, will keep the Board apprised of the identity of the companies that are carrying the Iowa traffic.

### **Step 3**

#### **Reduce the number of intermediate providers in the call paths.**

94. A key reason for the increased problems in rural areas is that a call is often handled by numerous different providers, the identities of which may not even be known to the originating provider,<sup>44</sup> resulting in nearly untraceable call routes. *In the Matter of*

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<sup>43</sup>“April 2014 Multistate 911 Outage: Cause and Impact, Report and Recommendations,” Public Safety Docket No. 14-72 (FCC Oct. 2014). See paragraph 34 above. Although the focus of the report was the vulnerability of the 911 system, the factors that account for this vulnerability, including the increasing reliance of IP-supported networks on geographically remote servers and on software-based components to support key functions, are equally applicable to the public telephone network as a whole.

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*Rural Call Completion*, 28 F.C.C.R. 16154 (Nov. 8, 2013) ¶¶ 17, 87, 88. A provider that limits the number of intermediate providers in the call path is better able to manage performance to rural destinations than a provider that sends calls through numerous intermediate providers. Limiting the number of intermediate providers also limits the potential for lengthy setup delay and looping. *Id.*<sup>45</sup> If a carrier can implement the “safe harbor” in the federal rules by limiting the number of intermediate providers on a call path to two or fewer, see 47 C.F.R. § 2107, as CenturyLink is proposing to do, that will help remediate the call failures. Even if a carrier cannot implement the safe harbor, or even if it is not subject to federal reporting requirements, it may be able to reduce the number of intermediate carriers in its call paths. The reductions can be accomplished either through new interconnection agreements or through new construction.

### Step 4

#### **Promote transparency in the use of downstream carriers**

95. Prior to the time that federal and state authorities began to investigate the rural call completion failures, many of the intermediate carriers were hidden from view. Some continue to resist relevant disclosures.<sup>46</sup> The lack of transparency lessens accountability. It also hampers the Board’s ability to understand and address the

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<sup>44</sup>The evidence here shows that CenturyLink does not know the identities of downstream carriers beyond the one to which it hands the calls. See ¶ 43 above.

<sup>45</sup>On the evidence here, the source of the problem was often post-dial delay. See ¶¶ 16-18 above.

<sup>46</sup>CenturyLink declined to produce the contracts between itself and the intermediate carriers in this docket. OCA Ex. CL-18; OCA Ex. CL-22, OCA Ex. CL-30, OCA Ex. CL-41. A motion to compel may have succeeded in obtaining the documents. See *Harris v. Board of Governors of Federal Reserve System*, 938 F.2d 720, 723 (7th Cir. 1991) (“The rights of a party to obtain documents under judicial process are not enjoyed at the sufferance of third parties who have agreed between themselves to keep documents secret”). Constraints of time and resources, however, prevent OCA from pursuing every hindrance to exhaustion. CenturyLink did produce the contract between itself and the intermediate carrier in Docket No. FCU-2013-0004, *In re Complaint of UnityPoint Clinic Family Medicine at Huxley*.

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difficulties. Under the FCC's rules, as one of the conditions for the safe harbor, covered providers must certify that any nondisclosure agreements with intermediate providers permit disclosure of the identity of the intermediate provider and any additional intermediate providers to the Commission and the affected rural local exchange carrier. 47 C.F.R. § 64.2107. Regardless of whether a carrier takes advantage of the federal safe harbor, and regardless of whether a carrier is subject to federal reporting requirements, a commitment to certify that any nondisclosure agreement permits disclosure to the Board of both the identity of any intermediate providers and the relevant contract would increase transparency and therefore contribute to a long-term solution.

### Step 5

#### **Actively participate in the standard-setting work of the Alliance for Telecommunications Industry Solutions**

96. The FCC has applauded efforts by the Alliance for Telecommunications Industry Solutions (ATIS) to diagnose problems in call routing, cooperate on finding solutions and adopt best practices aimed at solving the problem. *In the Matter of Rural Call Completion*, 28 F.C.C.R. 16154 (FCC Nov. 8, 2013) ¶ 12. Such efforts must continue, because the development of industry standards for call completion has not been completed.<sup>47</sup> Because all carriers must interconnect with the same public telephone

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<sup>47</sup>Through its Next Generation Interconnection Interoperability Forum (NGIIF), ATIS has worked with carriers and utility commissions to generate an "Intercarrier Call Completion/Call Termination Handbook" (ATIS Handbook) that describes industry standards and best practices that carriers can follow to address call completion issues and manage intermediate carriers. See *In re Complaint of Frahm*, No. FCU-2013-0007, Verizon resistance to motion to compel, filed July 11, 2014, p. 5. The ATIS Handbook, approved August 2012 and updated March 2013, is an excellent start at addressing the technical challenges but is not a finished product. On its own terms, it is "a living document" describing "some" of the problems being encountered and discussing "some" of the industry standards and practices relevant to ensuring call completion, particularly signaling, routing and trouble handling. ATIS Handbook, § 1.1. According to the handbook, carriers need to establish "Direct Measures of Quality" ("DMoQs"), such as "Call Completion Rate" and "Post Dial Delay," for their vendors to meet. The handbook does not, however, provide any standard or norm for what an acceptable metric value might be. See ATIS



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network, and because interoperability and coordination are needed across all components of the network, wide industry participation in this work will help. The metrics must be specific to the particular technologies. CenturyLink appears to acknowledge the challenges and is actively participating in the work at ATIS. OCA Ex. CL-50 (Attachment 50B, response to question 8); OCA Ex. CL-24HC.<sup>48</sup> It deserves credit for that. When and as new standards are developed, companies should report them to the Board, so the Board can ensure they adequately protect consumers and are followed. In time, as the standards are more fully developed for all technologies, the Board, either on its own for intrastate calls or in partnership with the FCC for all calls, should consider giving these standards, or some of them, with any modifications that public comment may require, the force and effect of law. See and compare 199 IAC 22.5(3).<sup>49</sup> .

### Step 6

#### **Exercise responsibility over the use of downstream intermediate carriers.**

97. Each originating and intermediate carrier that makes use of downstream intermediate carriers should have sound policies in place addressing each of the following elements.

- Establish and conduct standardized testing routines;

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Handbook, § 5.6 and Table 2. Some of the SIP (Session Initiation Protocols) mechanisms are not yet standardized. ATIS Handbook, § 4.1.1.3.

<sup>48</sup>OCA Ex. CL-24HC, filed with this report, is a discovery response from CenturyLink in No. FCU-2013-0005, *In re Complaint of Hancock County Health Systems*.

<sup>49</sup>The cited subrule contains specific standards that local exchange carriers must meet, among them: (i) complete dialing of called numbers on at least 97 percent of calls without encountering an all-trunks-busy condition, during average busy-season busy-hour; and (ii) properly tested alarms on a 24-hour basis to indicate improper functioning of equipment.

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- Investigate on an ongoing basis whether downstream carriers have properly designed and properly functioning equipment, including properly designed and properly functioning software;
- Investigate on an ongoing basis whether downstream carriers have sufficient capacity in their switches and call paths to carry the traffic to the intended destinations;
- Require each downstream carrier on an ongoing basis to provide specific information regarding its system and the limitations of its system, including information regarding any difficulties its system may have interoperating with other systems using a different technology;<sup>50</sup>
- Require each downstream carrier on an ongoing basis to provide specific information regarding any bandwidth or other capacity constraints that would prevent its system from completing calls to particular destinations at busy times;
- Require each downstream carrier to have properly designed and properly functioning alarms in its system so as to ensure immediate notice of any outages on its system;
- Require each downstream carrier to have properly designed and properly functioning mechanisms in place to ensure that the downstream carrier, if unable to complete a call, timely releases the call back to the upstream carrier (ATIS Handbook § 5.3);
- Require each downstream carrier to have properly designed and properly functioning mechanisms in place to ensure that the downstream carrier, if making successive attempts to route the call through different lower-tiered downstream carriers, timely passes the call to a second (or third or fourth) lower-tiered downstream carrier if a first (or second or third) lower-tiered downstream carrier cannot complete it;
- Require each downstream carrier to have properly designed and properly functioning mechanisms in place to detect and control looping, including the use of hop counters or other equivalent mechanisms that alert a carrier to the presence of a loop (ATIS Handbook § 4.1.3);
- Establish direct measures of quality and require downstream carriers to meet them (ATIS Handbook, § 5.6 and Table 2);

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<sup>50</sup>The need for such sharing of information will commonly override a carrier's desire to treat the information regarding its system as confidential.

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- Establish and implement appropriate sanctions for intermediate carriers that fail to meet standards;
- Require downstream carriers to manage lower-tiered downstream carriers and to hold lower-tiered downstream carriers to the same standards to which they themselves are held (ATIS Handbook § 5.8);
- Define the responsibilities of downstream carriers in an agreement (ATIS Handbook § 5 introduction).

### Step 7

#### **Provide copies of the Iowa portion of the federal data and the FCC's analysis of the Iowa data to the Board and OCA.**

98. The Board cannot effectively evaluate problems and ensure the implementation of successful solutions without ready access to relevant sources of information. Nor can OCA adequately discharge its responsibilities to Iowa consumers without such access. The FCC's data collection processes, including the generation of CAR and NER statistics for each rural OCN, including each rural OCN in Iowa, together with the FCC's analysis of these metrics, is specifically designed to provide relevant sources of information. For that reason, the Iowa data and the FCC's analysis of them would assist the Board in addressing the rural call completion problem in Iowa and assist OCA in representing the interests of Iowa consumers. On an ongoing basis, a company reporting to the FCC should therefore provide copies of its Iowa data and the FCC's analysis of the Iowa data to the Board and OCA.

### Step 8

#### **Keep routing tables up-to-date.**

99. Accurate routing tables are essential to successful call completion. *In the Matter of Rural Call Completion*, 28 F.C.C.R. 15164 (Nov. 8, 2013) ¶ 42 & n. 49. If the tables are not properly updated, for example, some calls may fall into a loop and never be

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set up. *In the Matter of Rural Call Completion*, 28 F.C.C.R. 1569 (Feb. 7, 2013)  
(separate statement of Commissioner Ajit Pai). Due to consumer elections to switch carriers and to local number portability, among other factors, these tables are changing constantly. Routing tables must therefore be kept up-to-date. The updating should be done through the Local Exchange Routing Guide (LERG) of the Traffic Routing Administration.

### Step 9

#### **Provide periodic progress reports to the Board on implementation.**

100. Each company should provide periodic reports to the Board regarding the progress it is making in fulfilling any commitments it makes.

## CONCLUSION

OCA submits this report setting forth the results of its investigation and its conclusions regarding concrete steps that the companies can take toward a long-term solution.

Respectfully submitted,

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